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Does remission from alcohol and drug use disorders increase the likelihood of smoking cessation among nicotine dependent young adults?

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Abstract

Background—This article tests the hypothesis that remission from substance use disorders is associated with smoking cessation in nicotine dependent young adults.

Design and methods—The sample was composed of 976 young adults with life-time substance use disorders and nicotine dependence who were subjects in the national epidemiologic survey on alcohol abuse and related conditions (NESARC). The Associated Disabilities Interview Schedule-DSM-IV Version was used to assess lifetime and past year psychiatric disorders.

Results—Past year nicotine cessation was obtained by self-report. Remission from substance use disorders was defined as the past year absence of DSM-IV substance use disorders . This study found that remission from substance use disorders increased the likelihood of smoking abstinence (OR = 1.7).

Conclusions—Our study found that remission from substance use disorders increased the likelihood of smoking abstinence in early adulthood. This finding is congruent with results from longitudinal studies.

Keywords

nicotine abstinence; recovery; substance dependence

Introduction

The health and economic related consequences of tobacco use are quite substantial. Between 1995 and 1999, smoking was associated with 440,000 premature deaths in the United States, and nearly $157 billion in health-related economic costs annually [28].

Since most people start smoking in adolescence, nicotine dependence has been referred to as a “pediatric disease”. The average frequent smoker will become a daily user by age 18 [40]. The 1999 national household survey on drug abuse (NHSDA) found that the prevalence of past month cigarette use was highest among persons aged 18–25, 41.6%, compared to persons older than age 34, 25.1% [41]. Though the occurrence of daily smoking among young adults has been declining, a disturbing increase in the prevalence of nicotine dependence has been observed [3]. Furthermore, a large prospective longitudinal study found that daily smoking during adolescence considerably increased the probability of developing drug use disorders in early adulthood, [25].

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General population studies have repeatedly observed a link between cigarette smoking and a wide variety of mental disorders [15,24]. The combination of substance use disorders and nicotine dependence has been associated with substantial adverse medical consequences. Hurt et al. [20], in an 10-year follow-up study of adults treated for substance dependencies, reported that in 50.9% of deaths, the underlying cause was tobacco-related.

Tobacco use is endemic among patients in substance abuse treatment. The Drug Abuse Treatment Outcome Study, a nationally representative study of 8,755 adults who entered treatment between 1991 and 1993, noted that 78% were smokers at admission [10]. This high rate of smoking approximates the 78–85% prevalence rates in other clinical samples [7,22, 35].

As expected, the prevalence of substance use disorders is substantial among nicotine dependent individuals. The national epidemiologic survey on alcohol and related conditions (NESARC) noted that the lifetime and past year prevalence of alcohol use and drug use were 22.8 and 8.2%, respectively, among individuals with tobacco dependence [15]. High rates of comorbidity were also found in a epidemiological study of young adult members of a health maintainence organization. The lifetime prevalence of alcohol dependence and cannabis dependence was 27.2. and 17.8%, respectively, among members with nicotine dependence [1].

These studies also found that adults with mood and anxiety disorders were two to three times more likely to develop tobacco dependence, compared to individuals without these disorders. Because these studies were cross-sectional, the causal link between mental disorders and nicotine dependence could not be determined. However, a prospective longitudinal study of a community based sample found that tobacco use during the early twenties did not increase the risk of major depression in the late twenties [5]. These discrepant finding may be due to the fact that the later study examined nicotine use, while the aforementioned studies examined nicotine dependence.

In the past decade studies have attempted to identify demographic and clinical predictors of smoking cessation in clinical and general community populations. Higher social class [4,11, 13], greater education, later onset age of smoking initiation [4,11,13,21,38], lower dependence severity [31,32,39] and a greater acknowledgement of the adverse health effects of smoking [21]; have been found to be favorable prognostic factors.

Conversely, psychiatric disorders appear to impede smoking cessation . Studies of clinical and epidemiological samples have noted that major depression and alcohol use disorders reduce the likelihood of quitting [2,14,36].

To date, studies of tobacco dependence have confined themselves to the relationship between drug use disorders or alcohol use disorders. Though a considerable proportion of the population have both substance use disorders [6,8,18], the link between both of these disorders and smoking discontinuation has not been examined in general populations studies of nicotine dependence. Accordingly, this study hypothesized that remission from one or more substance use disorders (drugs and/or alcohol) increased the probability of smoking cessation among nicotine dependent young adults.

Method

In brief, the Wave 1 national epidemiological survey on alcohol and related conditions (NESARC) is a nationally representative face-to-face survey of 43,093 respondents, aged 18 years and older, conducted by the NIAAA in 2001 through 2002. The target population of the survey is the civilian, noninstitituionalized population residing in the United States.

Experienced lay interviewers conducted the interviews. Regional supervisors re-contacted a random 10% of all respondents for quality-control purposes. There was no case in which it was determined that the interview had been conducted in any manner that was inconsistent with the interviewer's extensive training.

Measures

Diagnoses were generated by the NIAAA alcohol use disorder and associated disabilities interview schedule-DSM-IV Version (AUDADIS-IV) [36], a structured interview designed to be used by lay interviewers. Consistent with the DSM-IV, current (in the last 12 months) dependence diagnoses required respondents to meet criteria for at least three criteria for dependence during the last year. Current abuse diagnoses required a respondent to meet at least one criteria for abuse in the past year. Following DSM-IV guidelines, AUDADIS, distinguished mood and anxiety disorders that were not substance induced and that were not related to medical conditions, i.e. "primary" disorders. Respondents classified with mood and anxiety disorders that were substance-induced and/or due to a medical disorder, i.e. "secondary" disorders were not included in this report.

We defined smoking cessation as the absence of cigarette use during the past year. Remission from substance use disorders was operationalized as the absence of Alcohol Abuse/ Dependence Disorder or Drug Abuse/Dependence Disorder during the past year. In order to reduce the potential unreliability of respondent's recall of distal events regarding age of onset and remission from nicotine dependence and substance use disorders, we limited our analyses to subjects aged ≤30.

Statistical analysis

Univariate statistics were used to test for significant differences between smokers and nonsmokers with respect to past year mood disorders, anxiety disorders, substance use disorders, gender, race, education, onset of tobacco dependence, and total number of DSM-IV Nicotine Dependence (during worst episode). Following Hosmer and Lemeshow [19] guidelines for logistic regression analysis, variables which manifested significant between group differences ($P < 0.10$) were entered into an overall logistic regression model along with the following two-way interactions: substance use disorder × education, marital status × education, age × marital status, substance use disorder × marital status, onset of nicotine dependence × marital status, and marital status × education. Three-way interactions were excluded because of the difficulty of interpretation.

Secondary univariate data analyses were conducted to test for differences in demographic and clinical characteristics of remitted and unremitted substance use disorders.

Results

This sample consisted of 976 young adults, 83% of whom graduated high school; they were nearly evenly divided with respect to gender; a minority were married; past alcohol use disorders were more prevalent than drug use disorders; past year anxiety disorders and mood disorders were highly prevalent, 42% and 28%, respectively (Table 1).

Ten percent (94/976) reported cessation of cigarette smoking for the past year ; 28% were in past year substance abuse/dependence remission. In the univariate analyses, marital status, education, age, substance use disorder (past year), and onset of nicotine dependence were found to be associated with past year smoking status.

None of the interactions tested were statistically significant. The main effects of marital status, education, age, substance use disorder (past year), and onset of nicotine dependence, were

entered simultaneously into the logistic regression model. Results indicated that greater education, older age, being married, onset of nicotine dependence prior to adulthood, and the absence of a past year mood disorder and the absence of past year substance use disorder were correlated with smoking remission during the past year (Table 2).

Demographic and clinical variables associated with remission from substance use disorders were older age, being married, having attended college, having quit smoking, developing nicotine dependence after age 21, and not having bipolar disorder. Subjects with alcohol use disorders were less likely to be in remission relative to those with drug use disorders. Caucasian race was equivocally correlated with increased likelihood of remission. A history of anxiety disorders or Major Depression did not predict remission (Table 3).

To place these findings in context, we performed a post-hoc analysis, comparing nicotine cessation rates of young adults, who did not have a lifetime substance use disorder, to those found in our sample. Smoking quit rates were substantially higher among individuals whose substance use disorder remitted ($N = 245$), compared to persons without lifetime substance use disorders ($N = 549$), 12 and 4.6%, respectively, (OR = 2.9; 95% C.I. = 1.7, 5.1). However, quit rates did not differ between the later group and individuals whose substance use did not remit ($N = 725$), 7%, (OR = 1.6, 95% C.I. = 0.97, 2.6).

Discussion

Our study found that remission from substance use disorders increased the likelihood of smoking abstinence in early adulthood. This finding is congruent with results derived from a 3.5 year follow-up study of patients in a large health maintenance organization. Remission from alcohol use disorders, at baseline, was associated with nearly a threefold greater probability of quitting smoking compared to alcoholics not in remission at follow-up [2]. Similarly, a large longitudinal study of Canadian and American smokers found that lower alcohol use, at study entry, was associated with a greater probability of smoking cessation at follow-up [21].

Education, a measure of socioeconomic status, was a favorable predictor of smoking cessation, is in line with studies demonstrating that a variety healthy behaviors are correlated with level of education [33]. Furthermore, two large epidemiological studies observed a greater education was a favorable predictor of smoking cessation [4,11].

We observed that early onset of nicotine dependence, as opposed to early onset of cigarette use, was a favorable predictor of smoking cessation. Since our sample was composed of nicotine dependent individuals with substance use disorders, our finding may not generalize to nondependent nicotine users. However, this observation parallels Schuckit et al's [34] finding that younger onset age of alcohol dependence predicted alcohol abstinence. Interestingly, among adult cannabis dependent patients, Lozano et al. [26] found a strong association between higher dependence symptoms and patients' choice of abstinence as a treatment goal. We conjecture that individuals with early onset of dependence experience more negative consequences related to their use of substances; are less successful in controlling their use than individuals with late onset dependence; and that this difference may induce a greater proportion of the former group to adopt abstinence as a goal.

That quit smoking rates were substantially higher among individuals in remission from substance use disorders compared to peers without the later disorders was an unexpected finding. This post-hoc finding requires replication and use of multivariate statistics to confirm its validity.

The finding that non-remission from substance use disorders was linked with younger age, lower education, and being single replicates observations from the 1992 National Longitudinal Alcohol Epidemiological Survey [9] of alcohol dependence. The observation that younger age was an unfavorable predictor should be viewed with caution because these analyses were post-hoc, and they did not control for duration of substance use disorders.

Among clinical populations with substance use disorders and nicotine dependence, the risk that smoking cessation treatment may worsen the prognosis for recovery is a concern of addiction specialists [37]. However, a meta-analysis of 19 randomized control studies failed to find that link between smoking treatments and unfavorable substance use outcomes [29]. Furthermore, a recent review s of the literature confirmed this finding [16]. Unfortunately, relative few addiction programs offer smoking treatment, despite the high prevalence of nicotine use among their patients [30]. A greater awareness of the potential health benefits of smoking cessation interventions, and their lack of harm, may stimulate the provision of these treatments.

Though some anxiety disorders, specifically, Post-Traumatic Stress Disorder [12,17,27], and mood disorders have been found to decrease the likelihood of smoking cessation [24] this study failed did not find this association. We suspect that this difference is due to the fact that unlike previous studies, our sample was restricted to young adults with substance use disorders. It may be that substance use disorders are more powerful predictors of smoking cessation, relative to other comorbidities.

This investigation has several limitations. Data regarding smoking abstinence and substance use remission were entirely based on retrospective self-reports, which may not be reliable. Second, other factors found to affect smoking cessation, e.g., previous quit attempts, peer group selection, and use of cigarettes by live-in partner/spouse use were not measured.

Prospective studies of similar populations, using blood and urine samples to confirm self-reported smoking, alcohol, and illicit drug abstinence are needed to confirm our results. Since many persons who quit smoking relapse {Lancaster, 2006 #70} [23], studies are also needed to determine if factors that are found to predict remission also predict long-term abstinence.

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Table 1

Percentage distribution of young adults with lifetime DSM-IV substance use disorders and nicotine dependence, by selected characteristics

Characteristics (*N* = 976)	**Percent**	**SE**
Gender		
Males	60	0.02
Females	40	0.02
Race		
Whites	90	0.009
Non-whites	10	0.009
Age		
18–21	33	0.02
22–26	37	0.02
27–30	30	0.02
Married		
Yes	28	0.02
No	72	0.02
Education		
Did not complete high school	17	0.01
High school graduate	33	0.02
Attended college	38	0.02
Completed B.A.	12	0.01
Years of nicotine dependence		
<5 years	59	0.02
6–10 years	21	0.01
>10 years	20	0.01
Lifetime alcohol abuse/dependence		
Yes	89	0.01
No	11	0.01
Lifetime drug abuse/dependence		
Yes	42	0.02
No	58	0.02
Past year alcohol or drug abuse/dependence		
Yes	49	0.02
No	51	0.02
Past year primary mood disorder		
Yes	28	0.02
No	72	0.02
Past year primary anxiety disorder		
Yes	42	0.02
No	58	0.02

Table 2

Predictors of smoking cessation

Predictors	Adjusted			
	β	SE	OR	95% CI
Education				
High school dropout/graduate	Reference			
Attended college/completed college	0.507	0.245	1.7	1.0, 2.7
Age group				
18–21	Reference			
22–26	0.537	0.380	1.7	0.81, 3.6
27–30	1.9	0.377	6.6	3.2, 13.8
Marital status				
Married	0.863	0.243	2.4	1.5, 3.8
Divorced, separated, widowed, single	Reference			
Onset age nicotine dependence				
≤21	1.7	0.306	5.7	3.1, 10.3
>22	Reference			
Past year substance use disorder[a]				
No	0.555	0.247	1.7	1.1, 2.8
Yes	Reference			
Past year mood disorder				
No	Reference			
Yes	0.450	0.238	1.6	0.98, 2.5

[a] Alcohol or drug use abuse/dependence

Table 3

Comparison of demographic and clinical characteristics of remitted and non-remitted substance use disorders (past year)

Characteristics (*N* = 976)	**Remitted (*N* = 707)**	**Non-remitted (*N* = 259)**	**OR**	**95% CI**
Gender	%	%		
Males (reference)	23	77		
Females	34	66	0.58	0.43, 0.77
Race				
Whites (reference)	29	71		
Non-whites	20	80	1.6	1.0, 2.6
Age				
18–21 (reference)	13	87		
22–26	29	71	0.37	0.24, 0.56
27–30	37	63	0.25	0.17, 0.39
Marital status				
Married/common-law (reference)	37	63		
Divorced/separated	33	67	1.2	0.73, 1.9
Single	20	80	2.3	1.7, 3.2
Education				
Did not attend college (reference)	23	77		
Attended college	31	69	0.67	0.50, 0.89
Current (past year) smoker				
Yes (reference)	26	74		
No	40	60	0.52	0.34, 0.81
Onset age of nicotine dependence				
Early (≤21) (reference)	22	78		
Late (>21)	38	62	0.47	0.35, 0.62
Lifetime disorders				
Bipolar disorders				
No (reference)	21	79		
Yes	30	70	1.6	1.2, 2.3
Anxiety disorders				
No (reference)	28	72		
Yes	27	73	1.0	0.76, 01.4
Major depression				
No (reference)	27	73		
Yes	28	72	0.97	0.73, 1.3